Space Weather Forecast

Issued on Wednesday, 23 August 2023 at 13:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Ongoing chance of Moderate flares (R1-R2 Radio Blackouts). Slight chance G1 Minor Storms late day 1 or day 2 (23-24 Aug).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: An isolated Moderate flare was observed from a relatively simple sunspot in the northwest disc. There are currently a total of eight regions on the visible disk, however the majority are simple and mature unipolar or bipolar spots with little development. The main two of interest are situated on the southeast and northeast disc. The southeast region is a compact but potentially complex region, however it remains at too oblique an angle for an accurate analysis. The northwest spot is simpler, has seen some development of small spots to the north of its dominant leader

A large dimming in the Sun's corona was observed alongside the Moderate flare, and this can often suggest the release of a CME (coronal mass ejection) however no associated CME has been identified. A filament (line of plasma held together by the Suns magnetic field) also erupted to the southeast, however the associated CME is still under analysis. No other potentially Earth-directed CMEs were identified.

Solar Wind / Geomagnetic Activity: Solar winds persisted at slightly elevated speeds, at around 400-450 km/s. Total Interplanetary Magnetic Field (IMF) was weak with the north-south component varying weakly. Geomagnetic activity was Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is expected to be generally Low, but with a Chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs with the previously mentioned CME from the 23 Aug still under analysis. Current slightly elevated winds are likely to become enhanced later day 1 or day 2 (23-24) due to the arrival of a coronal hole sourced fast wind, potentially to around 500-550km/s. Mainly Quiet geomagnetic activity is expected at first, with isolated Unsettled spells. This increasing to Unsettled to Active later day 1 or day 2 (23-24 Aug), with a chance of isolated G1 Minor Storms. Activity is then expected to ease back to mostly Quiet to Unsettled day 3-4 (25-26 Aug). There is a slight chance of this rising again to Unsettled to Active due to another coronal hole based enhancement later day 4.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background with no solar radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	30	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	40	40
Very Active	R3 to R5 X	No	10	10	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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